UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

SEP 19 2011

John Bollier, Associate Vice President
Yale University
2 Whitney Avenue, 7th Floor
New Haven, Connecticut 06510-1220

Re: PCB Decontamination and Disposal Approval under 40 CFR § 761.61(c) and § 761.79(h)
Kline Geology Laboratory
Yale University, New Haven, Connecticut

Dear Mr. Bollier:

This is in response to the Yale University (Yale) Notification[1] for approval of a proposed plan to address PCB contamination at the Kline Geology Laboratory (the Site) located at 210 Whitney Avenue, New Haven, Connecticut. The Site contains PCB-contaminated materials that exceed the allowable PCB levels under 40 CFR § 761.20(a), §761.61 and § 761.62. Specifically, PCBs have been found in window caulk and glazing and in the adjacent building substrates (i.e., concrete, concrete block (CMU), brick, brownstone, plaster and terrazzo tiles)

Yale has requested an approval under 40 CFR § 761.61(c) that includes the following activities:

- Remove and dispose of PCB caulk with greater than or equal to ($\geq$ 50 parts per million (ppm) in a TSCA approved or hazardous waste landfill;
- Remove *non-porous surfaces* (e.g., metal window frames and components, including glazing) in direct contact with PCB caulk, and dispose of as a $\geq$50 ppm waste in a TSCA approved or hazardous waste landfill;
- Conduct additional characterization sampling of exterior *porous surfaces* to define extent of PCB contamination for encapsulation; and,

[1] The Notification was prepared by Woodard & Curran on behalf of the Yale to satisfy the requirements under 40 CFR § 761.61(c) and § 761.79(h). Information was submitted dated August 5, 2011 (PCB Remediation Plan); September 1, 2011 (Response to EPA Comments); and, September 13, 2011 (email clarification on brownstone encapsulation). These submittals shall be referred to as the "Notification".

- Encapsulate PCB-contaminated *porous surfaces* (i.e., concrete, CMU, brick, brownstone, plaster and terrazzo tiles) with two coats of an elastomeric acrylic-based coating or liquid sealant if the PCB concentration is greater than (>) 1 ppm in areas considered to be *high occupancy areas* or > 25 ppm in areas considered to be *low occupancy areas* as defined in § 761.3.

Based on the EPA's review, the information provided in the Notification meets the requirements under § 761.62(a) and § 761.79(h) for abatement of PCB caulk and glazing and PCB-contaminated *non-porous surfaces* and § 761.61(c) for encapsulation of the PCB-contaminated *porous surfaces*. EPA finds that the proposed encapsulation of PCB-contaminated *porous surfaces* should effectively prevent direct exposure of these PCB-contaminated *porous surfaces* to building users provided the physical barriers are maintained. As such, EPA may approve the encapsulation under § 761.61(c).

Yale may proceed with its project in accordance with 40 CFR § 761.61(c); § 761.62(a); § 761.79(h); its Notification; and, this Approval, subject to the conditions of Attachment 1. Under this Approval, EPA is reserving its rights to require additional investigation or mitigation measures should EPA determine that the encapsulation is not effective in eliminating exposure to PCBs. Please note that Yale will be required to record a notation on the deed as required under § 761.61(a)(8) since PCBs at greater than (>) 1 ppm will remain on the Site.

This Approval only addresses cleanup and disposal of the *PCB bulk product waste* and *PCB remediation waste* identified in the Notification. In the event Yale identifies other PCB contamination at the Site, including but not limited to, other non-liquid PCB products or PCB-contaminated soils, Yale may modify its plan to clean up these PCBs in accordance with Attachment 1, Condition 17. Otherwise, Yale shall submit a separate plan to address cleanup of the PCB materials in accordance with 40 CFR 761.

This Approval does not release Yale from any applicable requirements of federal, state or local law, including the requirements related to cleanup and disposal of PCBs or other contaminants under the Connecticut Department of Energy and Environmental Protection (CT DEEP) regulations.

Questions and correspondence regarding this Approval should be directed to:

Kimberly N. Tisa, PCB Coordinator (OSRR07-2)
United States Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3912
Telephone: (617) 918-1527
Facsimile: (617) 918-0527

EPA shall not consider this project complete until it has received all submittals required under this Approval. Please be aware that upon EPA receipt and review of the submittals, EPA may request any additional information necessary to establish that the work has been completed in accordance with 40 CFR Part 761, the Notification, and this Approval.

Sincerely,

James T. Owens III, Director
Office of Site Remediation & Restoration

cc S. Murdzia, Yale
D. Monz, Updike, Kelly & Spellacy, P.C.
J. Hamel, Woodard & Curran
G. Trombly, CT DEEP
File

Attachment 1 – PCB Approval Conditions
Attachment 2 - *Standard Operating Procedure For Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs) Revision 4, May 5, 2011*

ATTACHMENT 1:

PCB DECONTAMINATION AND DISPOSAL APPROVAL CONDITIONS
KLINE GEOLOGY LABORATORY (the Site)
YALE UNIVERSITY
NEW HAVEN, CONNECTICUT

GENERAL CONDITIONS

1. This Approval is granted under the authority of Section 6(e) of the Toxic Substances Control Act (TSCA), 15 U.S.C. § 2605(e), and the PCB regulations at 40 CFR Part 761, and applies solely to the *PCB bulk product waste* and the *PCB remediation waste* located at the Site and identified in the Notification.

2. Yale University (Yale) shall conduct on-site activities in accordance with the conditions of this Approval and with the Notification.

3. In the event that the cleanup plan described in the Notification differs from the conditions specified in this Approval, the conditions of this Approval shall govern.

4. The terms and abbreviations used herein shall have the meanings as defined in 40 CFR § 761.3 unless otherwise defined within this Approval.

5. Yale must comply with all applicable federal, state and local regulations in the storage, handling, and disposal of all PCB wastes, including PCBs, PCB Items and decontamination wastes generated under this Approval. In the event of a new spill during response actions, Yale shall contact EPA within 24 hours for direction on PCB cleanup and sampling requirements.

6. Yale is responsible for the actions of all officers, employees, agents, contractors, subcontractors, and others who are involved in activities conducted under this Approval. If at any time Yale has or receives information indicating that Yale or any other person has failed, or may have failed, to comply with any provision of this Approval, it must report the information to EPA in writing within 24 hours of having or receiving the information.

7. This Approval does not constitute a determination by EPA that the transporters or disposal facilities selected by Yale are authorized to conduct the activities set forth in the Notification. Yale is responsible for ensuring that its selected transporters and disposal facilities are authorized to conduct these activities in accordance with all applicable federal, state and local statutes and regulations.

8. This Approval does not: 1) waive or compromise EPA's enforcement and regulatory authority; 2) release Yale from compliance with any applicable requirements of federal, state or local law; or 3) release Yale from liability for, or otherwise resolve any violations of federal, state or local law.

NOTIFICATION AND CERTIFICATION CONDITIONS

9. This Approval may be revoked if the EPA does not receive written notification from Yale of its acceptance of the conditions of this Approval within 10 business days of receipt.

10. Yale shall submit the following information for EPA review and/or approval:

    a. A certification signed by its selected abatement/demolition contractor, stating that the contractor(s) has read and understands the Notification, and agrees to abide by the conditions specified in this Approval;

    b. A contractor work plan, prepared and submitted by the selected demolition or abatement contractor(s) describing the containment and air monitoring that will be employed during abatement activities. This work plan should also include information on how and where wastes will be stored and disposed of, and on how field equipment will be decontaminated; and,

    c. A certification signed by the selected analytical laboratory, stating that the laboratory has read and understands the extraction and analytical method requirements and quality assurance requirements specified in the Notification and in this Approval.

DECONTAMINATION AND DISPOSAL CONDITIONS

11. To the maximum extent practical, engineering controls, such as barriers, and removal techniques, such as the use of HEPA ventilated tools, shall be utilized during removal processes. In addition, to the maximum extent possible, disposable equipment and materials, including PPE, will be used to reduce the amount of decontamination necessary.

12. PCB-contaminated building materials shall be abated and verification sampling and analysis shall be conducted as described below:

    a. All visible residues of PCB caulk and associated wastes, including PCB-contaminated window frames and components, shall be removed and disposed of as described in the Notification.

b. PCB-contaminated *porous surfaces* shall be encapsulated as described in the Notification. The following decontamination standards shall apply (i.e., encapsulation shall not be required):

i) *High Occupancy Areas*: less than or equal to (≤ 1 part per million (ppm) PCBs

(1) Indoor *porous surfaces* (i.e., CMU)

(2) Exterior *porous surfaces* (i.e., brick and brownstone) on the north elevations of the first floor

(3) Exterior *porous surfaces* (i.e., concrete) on the east elevations of the basement

ii) *Low Occupancy Areas*: less than or equal to (≤ 25 ppm PCBs

(1) Exterior *porous surfaces* (i.e., brick and brownstone) on the east and south elevations of the first floor

(2) Exterior *porous surfaces* (i.e., brick, brownstone, plaster, and terrazzo tiles) on the second and third floor

c. Following encapsulation of PCB-contaminated *porous surfaces*, post-encapsulation sampling shall be conducted to determine the effectiveness of the encapsulation.

i) Surface wipe samples shall be collected from encapsulated *porous surfaces*. Wipe sampling of encapsulated surfaces shall be performed on a surface area basis by the standard wipe test as specified in 40 CFR § 761.123 (i.e., µg/100 cm^2).

ii) Chemical extraction for PCBs shall be conducted using Method 3500B/3540C of SW-846; and, chemical analysis for PCBs shall be conducted using Method 8082 of SW-846, unless another extraction or analytical method(s) is validated according to Subpart Q.

iii) In the event that PCB concentrations in the wipe samples are greater than (>) 1 µg/100 cm^2, Yale shall contact EPA for further discussion and direction on alternatives.

d. Initial post-abatement indoor air sampling and indoor surface wipe sampling for PCBs shall be conducted to determine the impact of the abatement activities.

i) Initial post-abatement sampling

(1) Indoor air sampling shall be conducted in accordance with EPA Method TO-4A or TO-10A. Sufficient sample volumes shall be collected to provide a minimum laboratory reporting limit of less than (<) 0.05 $\mu g/m^3$. At a minimum, PCB analysis shall include PCB homologues and/or PCB congeners.

(2) Wipe sampling of indoor surfaces shall be performed on a surface area basis by the standard wipe test as specified in 40 CFR § 761.123 (i.e. $\mu g/100\ cm^2$). Chemical extraction for PCBs shall be conducted using Methods 3500B/3540C of SW-846 and chemical analysis for PCBs shall be conducted using Method 8082 of SW-846, unless another method(s) is validated according to Subpart Q.

ii) In the event that PCB concentrations in the wipe samples are greater than or equal to ($\geq$) 1 $\mu g/100\ cm^2$ or air samples results are > 0.450 $\mu g/m^3$, Yale shall contact EPA for further discussion and direction on alternatives, which may include development of a site-specific risk exposure assessment.

iii) Within 7 days of receipt of this Approval, Yale shall submit a plan identifying the number and locations of the post-abatement air and surface wipe samples.

e. Yale shall submit a monitoring and maintenance implementation plan (MMIP) to monitor the long-term effectiveness of the encapsulants. (See Condition 15).

13. PCB waste (at any concentration) generated as a result of the activities described in the Notification, excluding any decontaminated materials, shall be marked in accordance with CFR 40 CFR § 761.40; stored in a manner consistent with 40 CFR § 761.65; and, disposed of in accordance with 40 CFR § 761.61 or § 761.62, unless otherwise specified below.

a. Decontamination wastes and residues shall be disposed of in accordance with 40 CFR § 761.79(g)(6).

b. Moveable equipment, tools, and sampling equipment shall be decontaminated in accordance with either 40 CFR § 761.79(b)(3)(i)(A), § 761.79(b)(3)(ii)(A), or § 761.79(c)(2).

c. PCB-contaminated water generated during decontamination shall be decontaminated in accordance with 40 CFR § 761.79(b)(1) or disposed of under § 761.60.

DEED RESTRICTION AND USE CONDITIONS

14. Within thirty (30) days of completing the activities described in the Notification and in the Approval, Yale shall submit for EPA review and approval, a draft deed restriction for the Site. The deed restriction shall include: a description of the extent and levels of contamination at the Site following abatement; a description of the actions taken at the Site; a description of the use restrictions for the Site; and the long-term monitoring and maintenance requirements on the Site. Within seven (7) days of receipt of EPA's approval of the draft deed restriction, Yale shall record the deed restriction. A copy of this Approval shall be attached to the deed restriction.

INSPECTION, MODIFICATION AND REVOCATION CONDITIONS

15. Within 60 days of completion of the work authorized under this Approval, Yale shall submit for EPA's review and approval, a detailed monitoring and maintenance implementation plan (MMIP) for the surface barriers. Yale shall incorporate any changes to the MMIP required by EPA.

    a. The MMIP shall include: a description of the activities that will be conducted, including inspection criteria, frequency, and routine maintenance activities; sampling protocols, sampling frequency, and analytical criteria; and, reporting requirements, as applicable.

    b. The MMIP shall include a communications component which details how the maintenance and monitoring results will be communicated to the Site users, including parents, students, other on-site workers, and interested stakeholders.

    c. The MMIP also shall include a worker training component for maintenance workers or for any person that will be conducting work that could impact the barriers encapsulating the PCB-contaminated surfaces.

    d. Yale shall submit the results of these long-term monitoring and maintenance activities to EPA. Based on its review of the results, EPA may determine that modification to the MMIP is necessary in order to monitor and/or evaluate the long-term effectiveness of the barriers.

    e. Activities required under the MMIP shall be conducted until such time that EPA determines, in writing, that such activities are no longer necessary.

16. Yale shall allow any authorized representative of the Administrator of the EPA to inspect the Site and to inspect records and take samples as may be necessary to determine compliance with the PCB regulations and this Approval. Any refusal by Yale to allow such an inspection (as authorized by Section 11 of TSCA) shall be grounds for revocation of this Approval.

17. Any modification(s) in the plan, specifications, or information submitted by Yale, contained in the Notification, and forming the basis upon which this Approval has been issued, must receive prior written approval from the EPA. Yale shall inform the EPA of any modification, in writing, at least ten (10) days prior to such change. No action may be taken to implement any such modification unless the EPA has approved of the modification, in writing. The EPA may request additional information in order to determine whether to approve the modification. If such modification involves a change in the use of the Site which results in exposures not considered in the Notification, the EPA may revoke, suspend, and/or modify this Approval upon finding that this risk-based cleanup and disposal action may pose an unreasonable risk of injury to health or the environment due to the change in use. EPA may take similar action if the EPA does not receive requested information needed from Yale to make a determination regarding potential risk.

18. Any departure from the conditions of this Approval without prior, written authorization from the EPA may result in the revocation, suspension and/or modification of the Approval, in addition to any other legal or equitable relief or remedy the EPA may choose to pursue.

19. Any misrepresentation or omission of any material fact in the Notification or in any future records or reports may result in the EPA's revocation, suspension and/or modification of the Approval, in addition to any other legal or equitable relief or remedy the EPA may choose to pursue.

20. Approval for these activities may be revoked, modified or otherwise altered: if EPA finds a violation of the conditions of this Approval or of 40 CFR Part 761, including EPA's PCB Spill Cleanup Policy, or other applicable rules and regulations; if EPA finds that these activities present an unreasonable risk to public health or the environment; if EPA finds that there is migration of PCBs from the Site; or if EPA finds that changes are necessary to comply with new rules, standards, or guidance for such approvals. Yale may apply for appropriate modifications in the event new rules, standards, or guidance comes into effect.

RECORDKEEPING AND REPORTING CONDITIONS

21. Yale shall prepare and maintain all records and documents required by 40 CFR Part 761, including but not limited to the records required under Subparts J and K. A written record of the decontamination and disposal and the analytical sampling shall be established and maintained by Yale in one centralized location, until such time as EPA approves in writing a request for an alternative disposition of such records. All records shall be made available for inspection to authorized representatives of EPA.

22. As required under Condition 15 of this Approval, Yale shall submit the results of the long-term monitoring and maintenance activities to EPA as specified in the final MMIP to be approved by EPA.

23. Yale shall submit a final report to the EPA within 90 days of completion of the activities authorized under this Approval. At a minimum, this final report shall include: a short narrative of the project activities; characterization and confirmation sampling analytical results, including indoor air and surface wipe sampling; copies of the accompanying analytical chains of custody; field and laboratory quality control/quality assurance checks; an estimate of the quantity of PCB waste disposed of and the size of the PCB cleanup area(s); copies of manifests and bills of lading; and copies of certificates of disposal or similar certifications issued by the disposer. The Report shall also include a copy of the recorded deed restriction and a certification signed by a Yale official verifying that the authorized activities have been implemented in accordance with this Approval and the Notification.

24. Required submittals shall be mailed to:

    Kimberly N. Tisa, PCB Coordinator
    United States Environmental Protection Agency
    5 Post Office Square, Suite 100 – (OSRR07-2)
    Boston, Massachusetts 02109-3912
    Telephone: (617) 918-1527
    Facsimile: (617) 918-0527

25. No record, report or communication required under this Approval shall qualify as a self-audit or voluntary disclosure under EPA audit, self-disclosure or penalty policies.

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END OF ATTACHMENT 1